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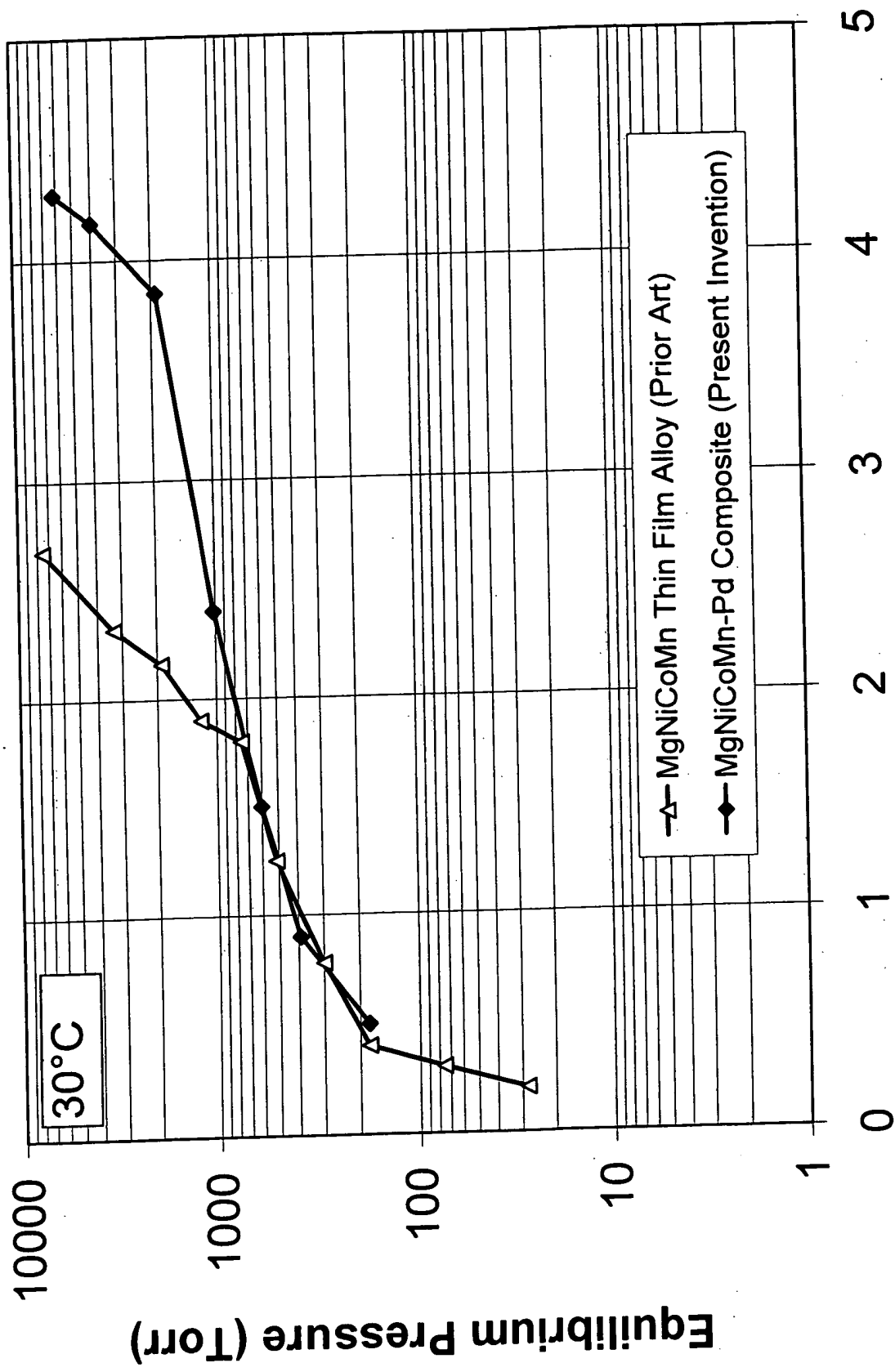
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Hydrogen wt. % $H/(H+M)$

Figure 1

H₂ Desorption Amounts for AR026

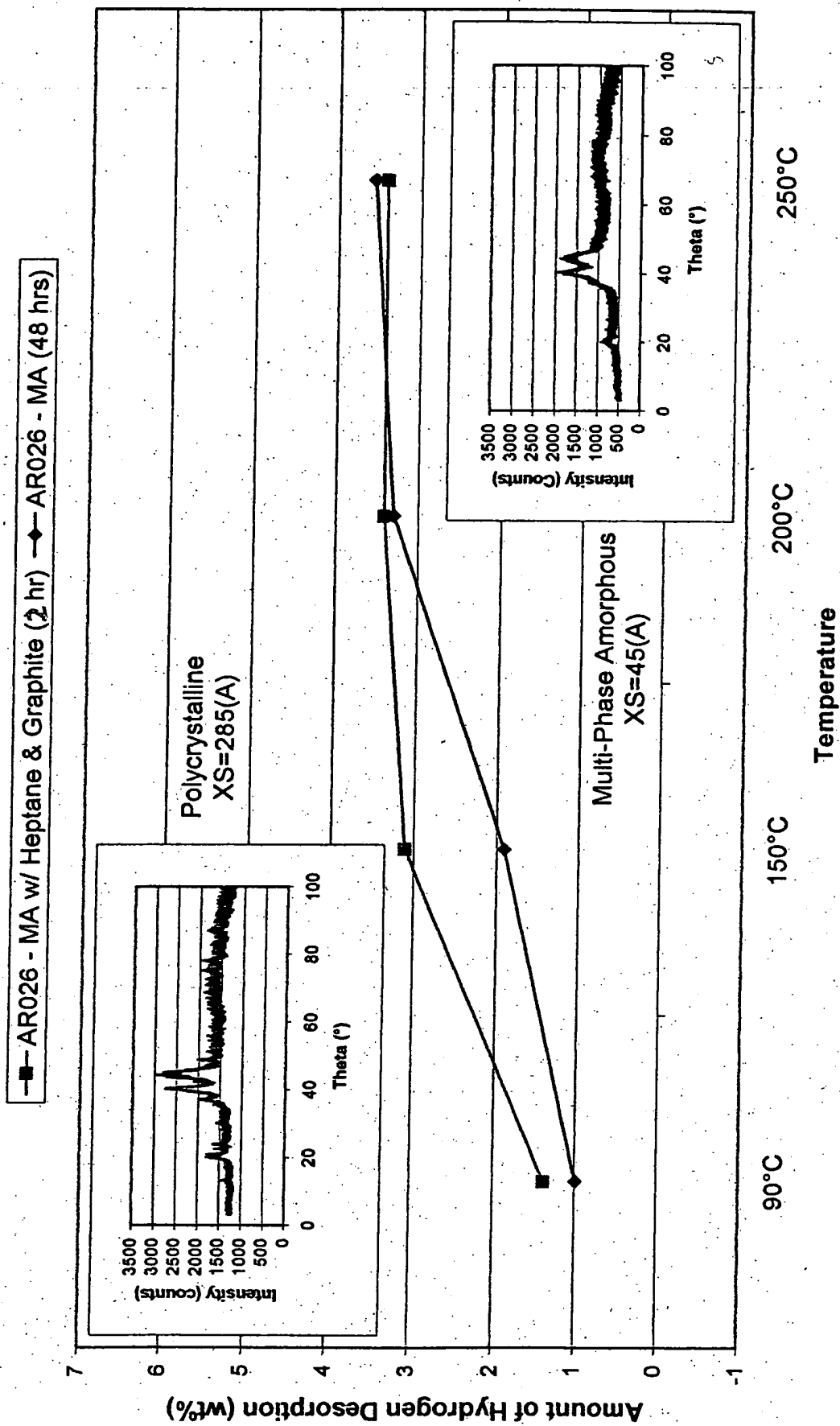


Figure 2

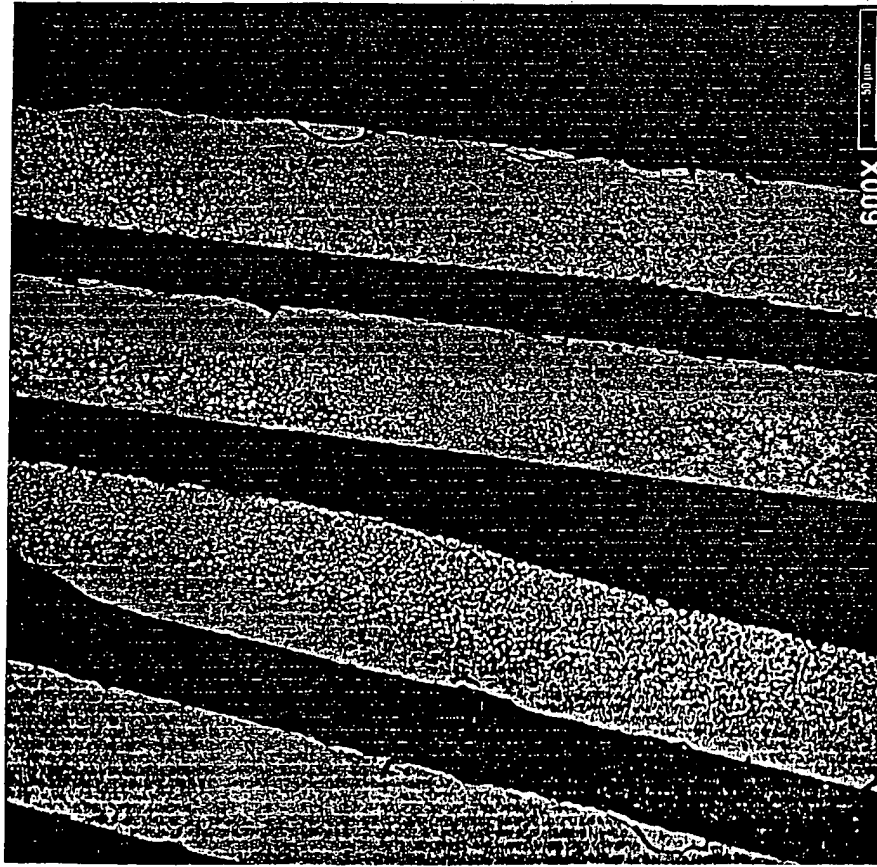


Figure 3A

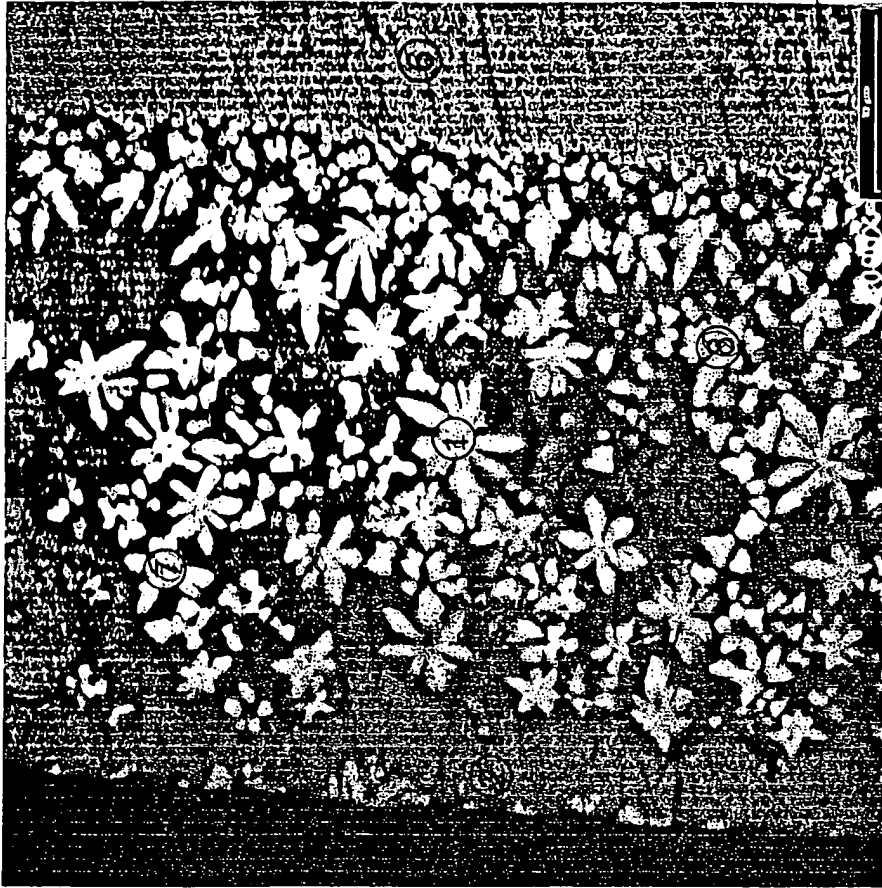


Figure 3B

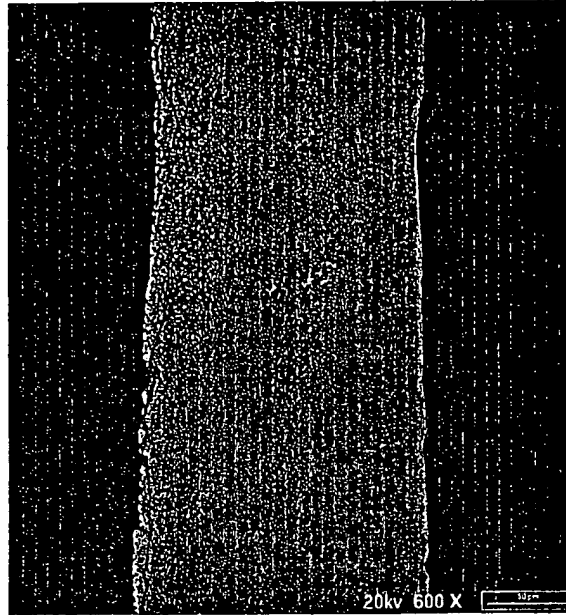


Figure 4

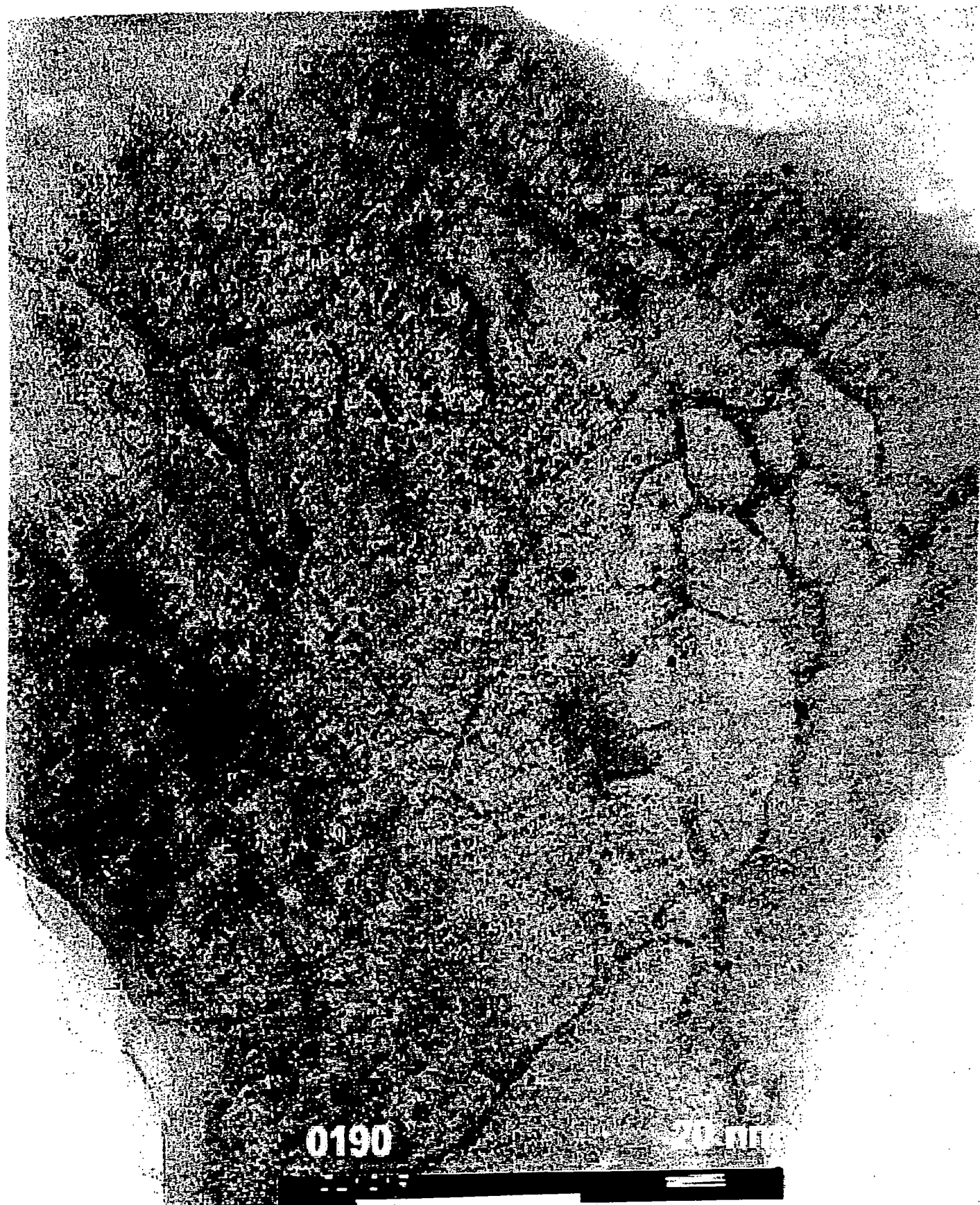


Figure 5

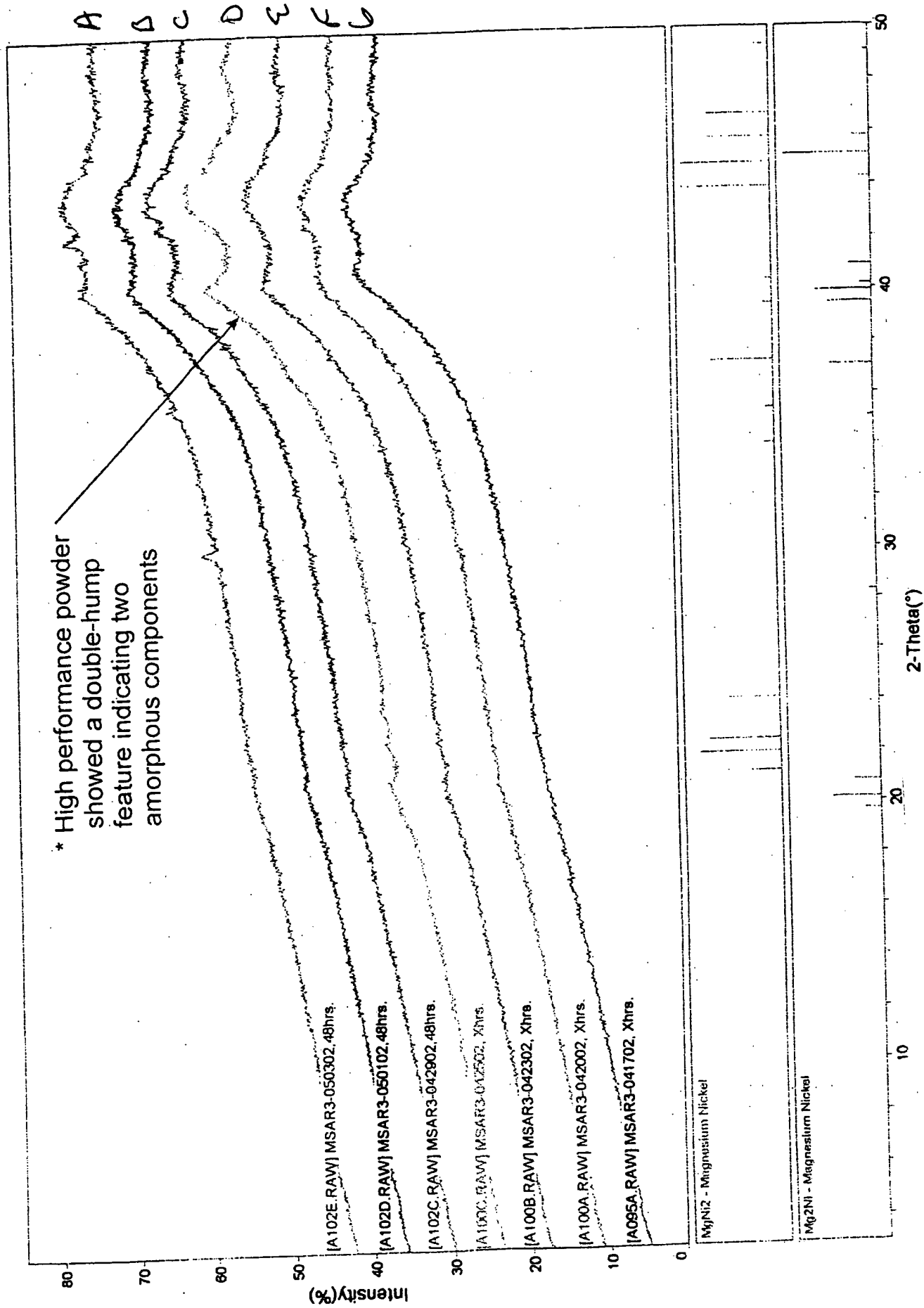


Figure 6

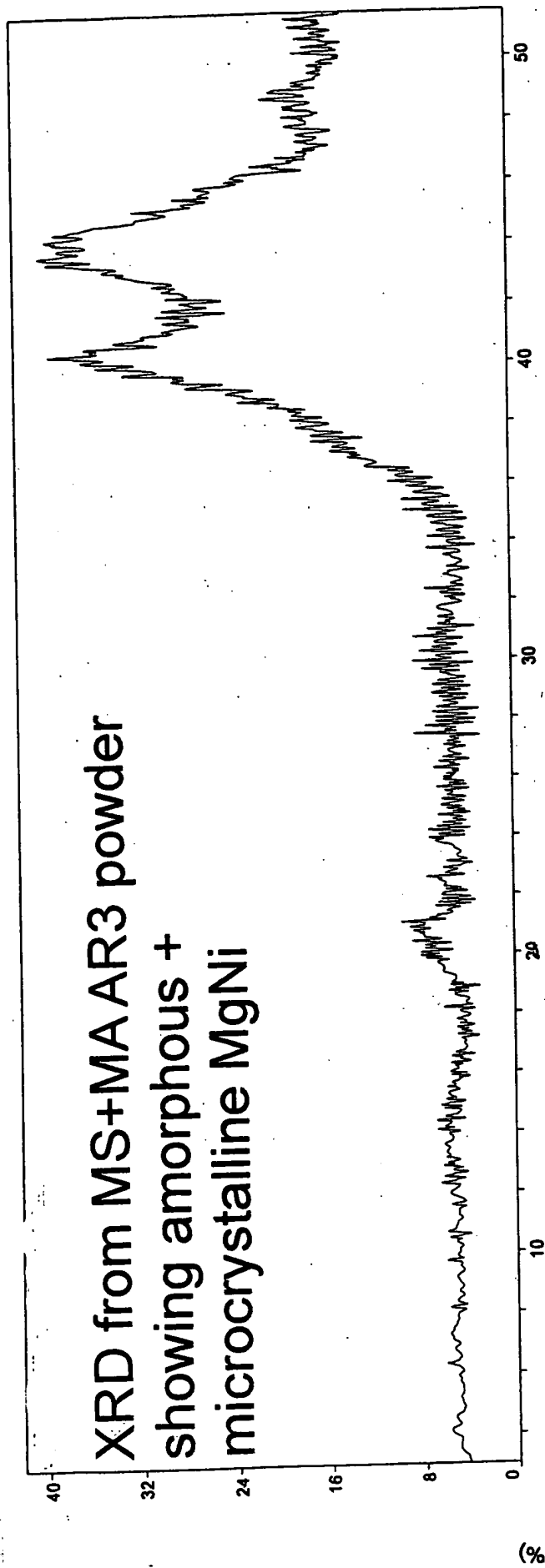


Figure 7B

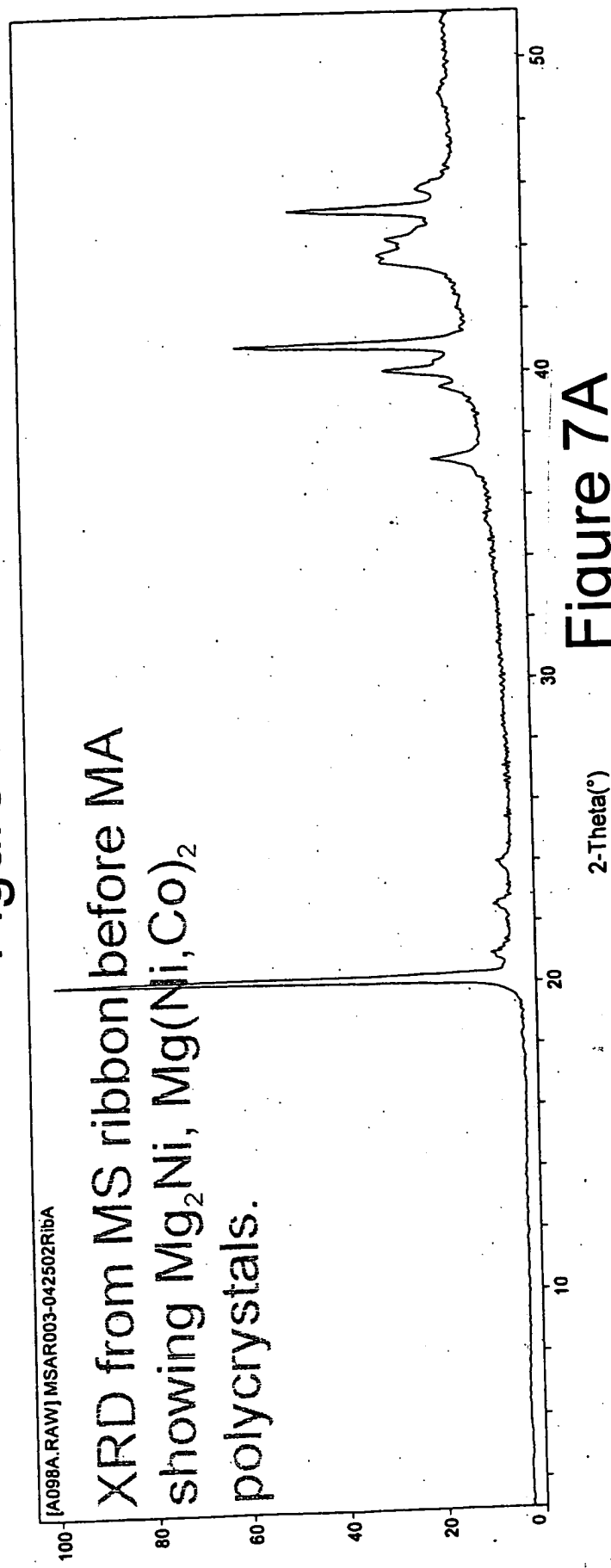


Figure 7A

H₂ Desorption Amounts for AR031 Material (4 hour Desorption Time)

A-AR031- 2 hr Grind w/ Heptane and Graphite in Glove Box, Pressed in Ar - Coated w/ Pd (Cycle 2)
 B-AR031- 2 hr Grind w/ Heptane and Graphite in Glove Box, Pressed in Ar - Coated w/ Fe (Cycle 2)
 C-AR031- 2 hr Grind w/ Heptane and Graphite in Glove Box, Pressed in Ar - Coated w/ 10Å Pd & 10Å Fe
 D-AR031- 2 hr Grind w/ Heptane and Graphite in Glove Box, Pressed in Ar - Coated w/ 100Å Pd & 100Å Fe (Cycle 2)

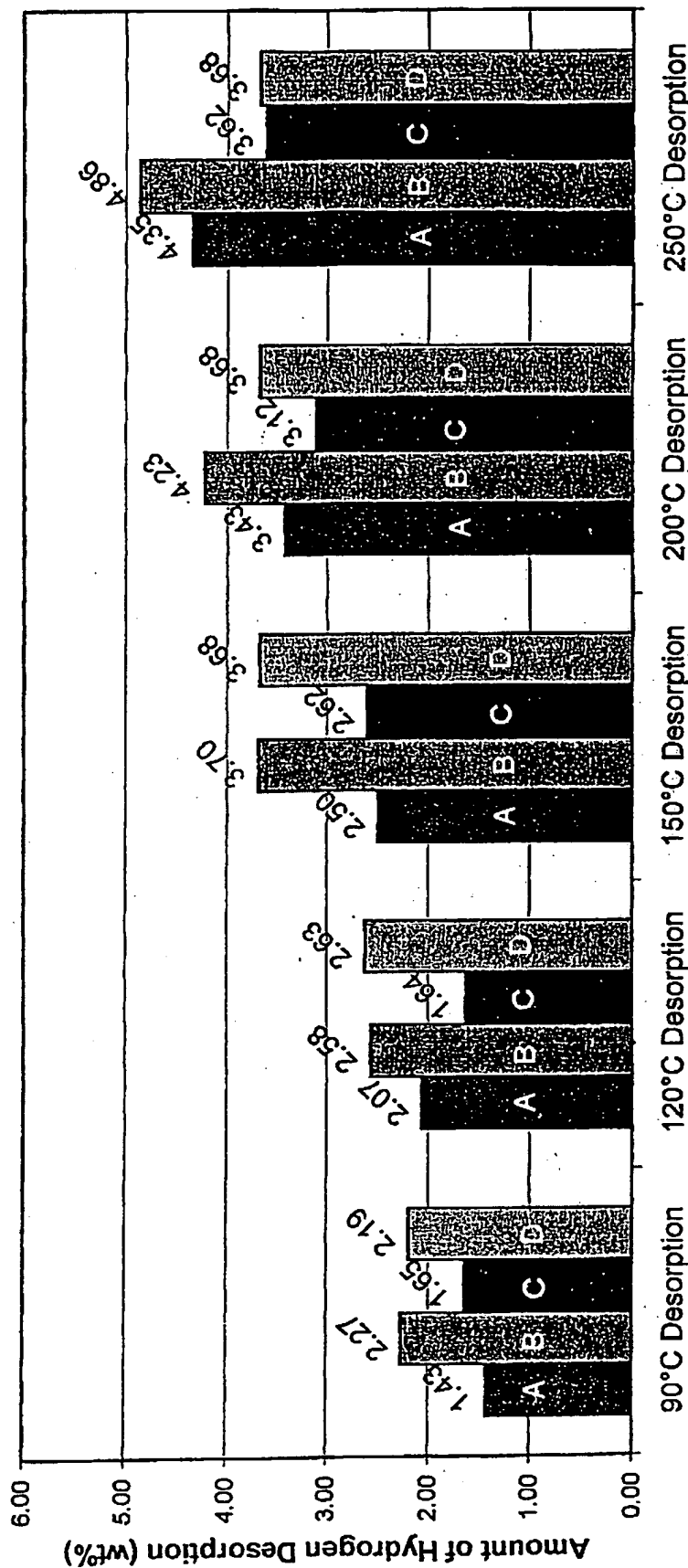


Figure 8A

H₂ Desorption Amounts for AR026 and AR031 **2 hr Grind w/ Heptane and Graphite in Glove Box, Press in Ar** **(4 hour Desorption Time)**

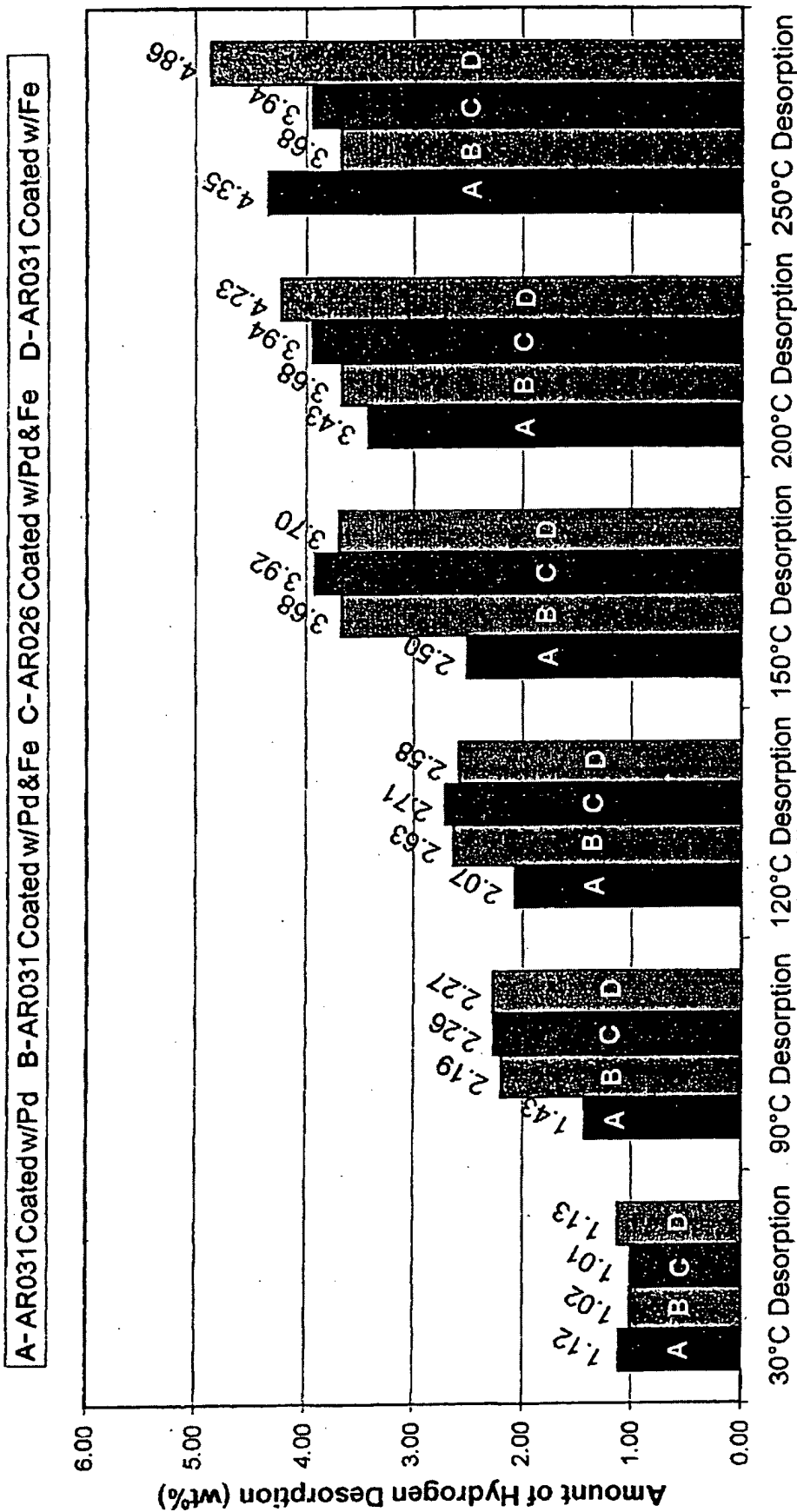
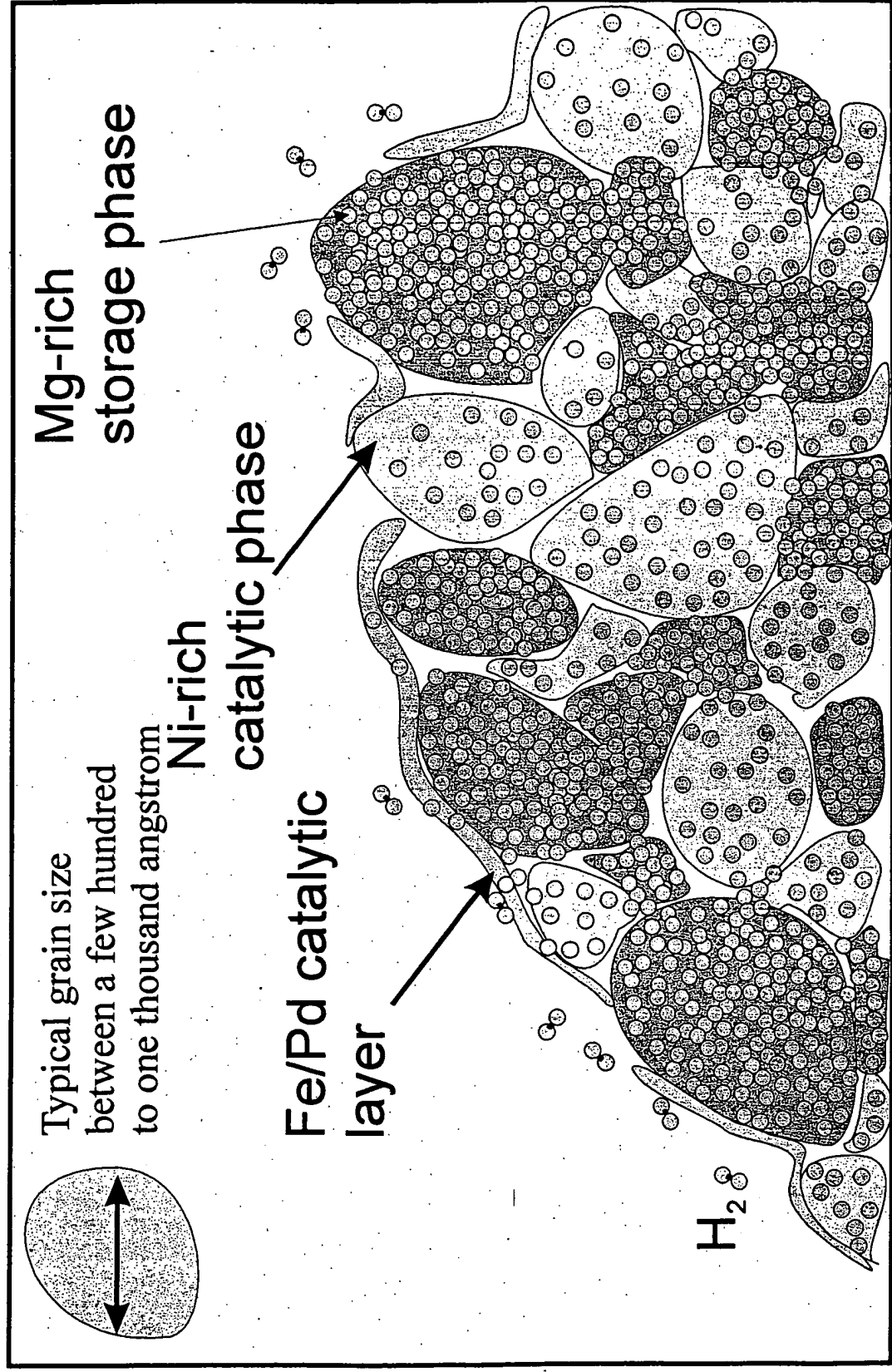


Figure 8B

Hydrogen Desorption in Mg-based AR Material



- * Pd-layer only makes limited contribution to H-desorption due to low H-content
- * The surface of Mg-rich storage phase may be the main area to recombine the H-atoms.

Figure 9

Absorption Rate Measure MSAR003, 26, 30, and 31 Material at 90°C

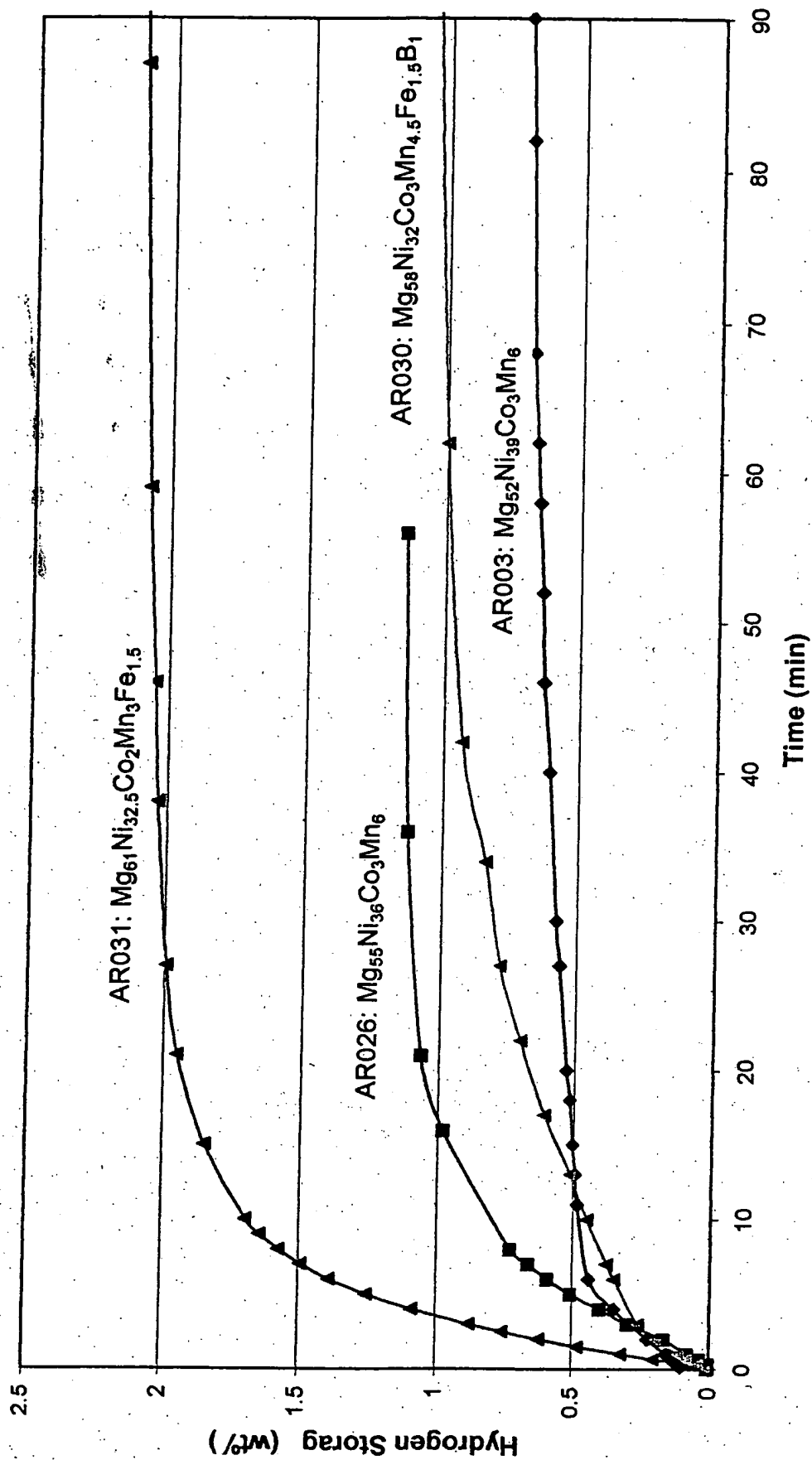


Figure 10

Cycling Stability at 200°C

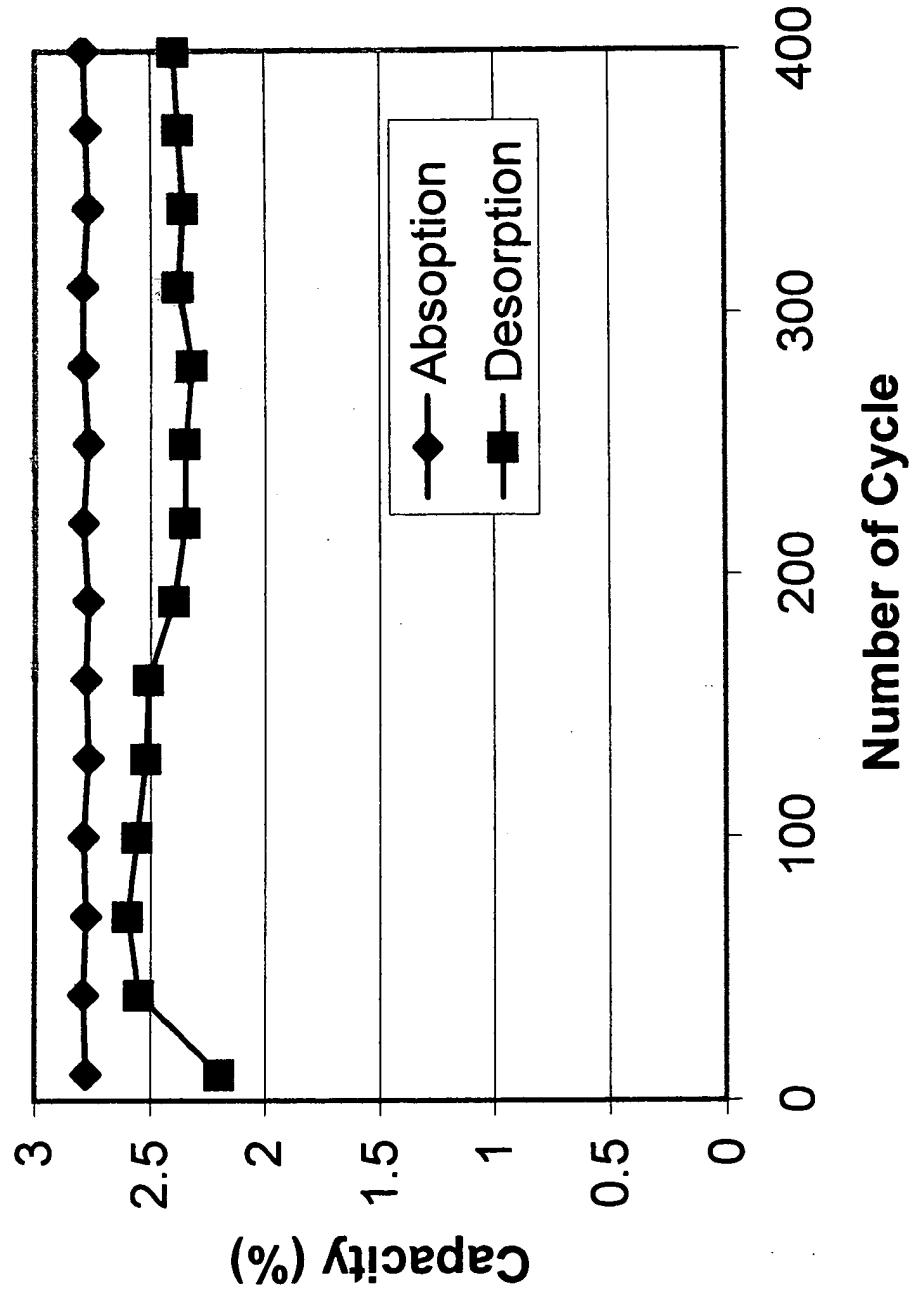


Figure 11

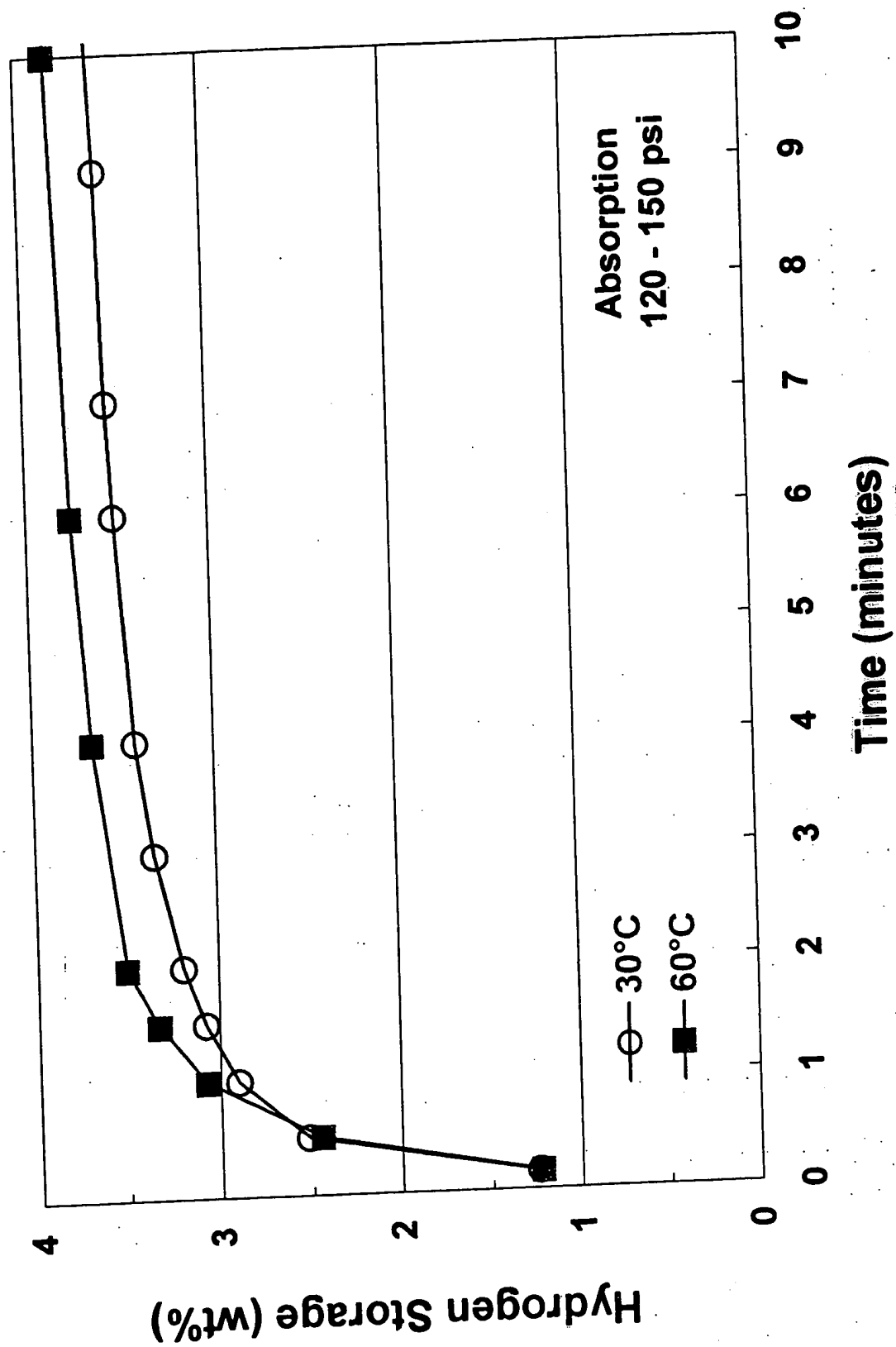


Figure 12

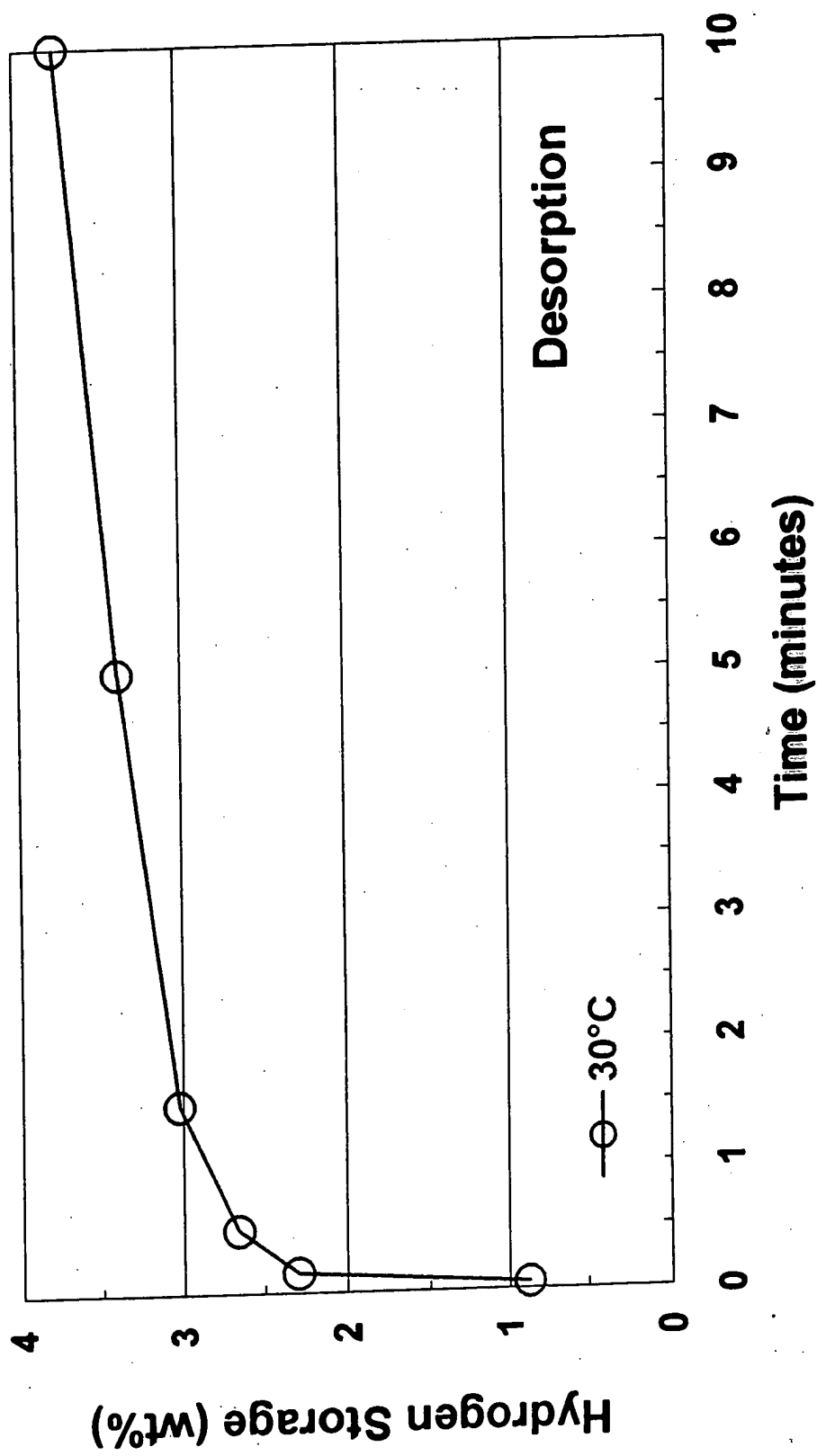


Figure 13

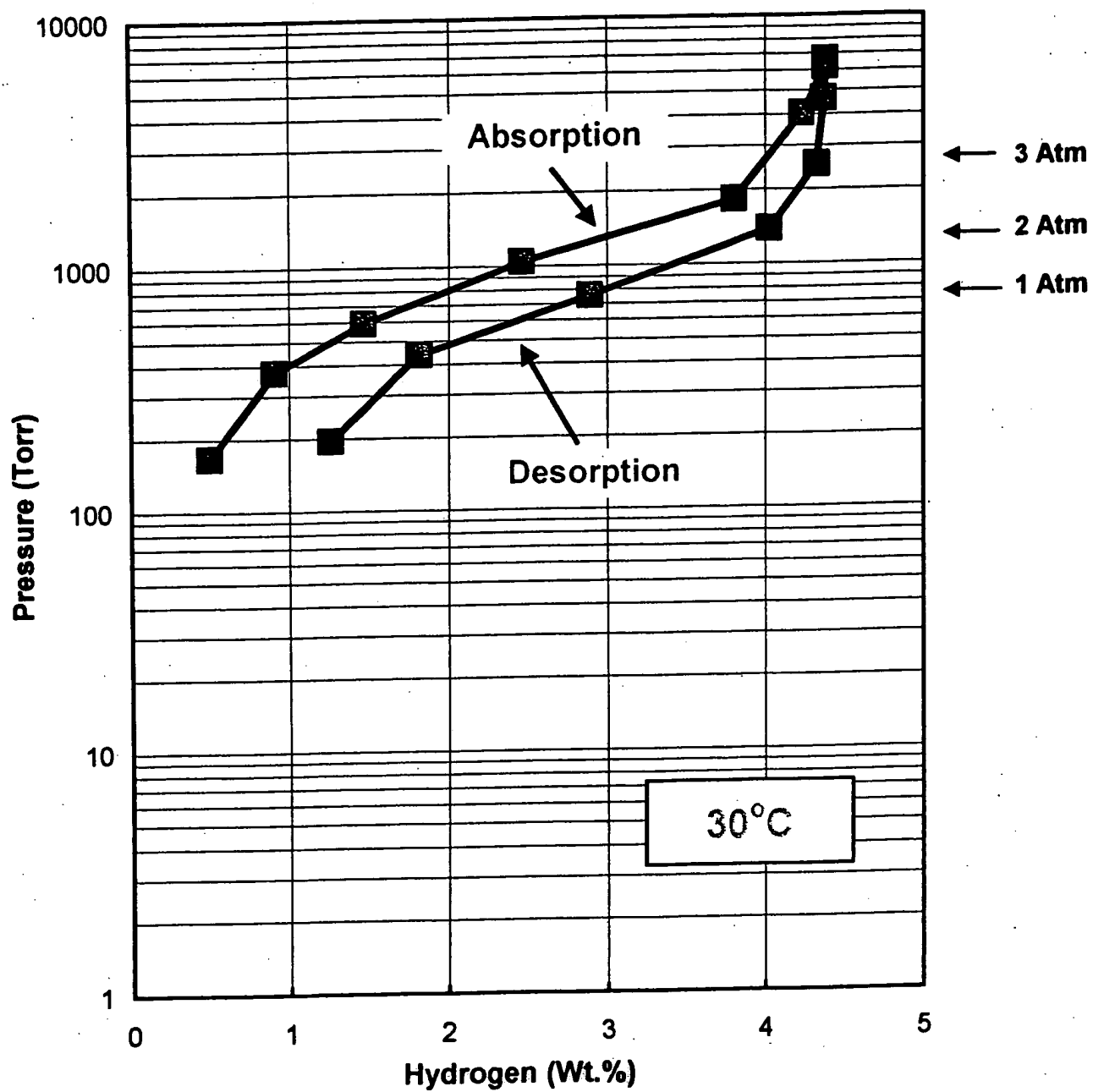


Figure 14

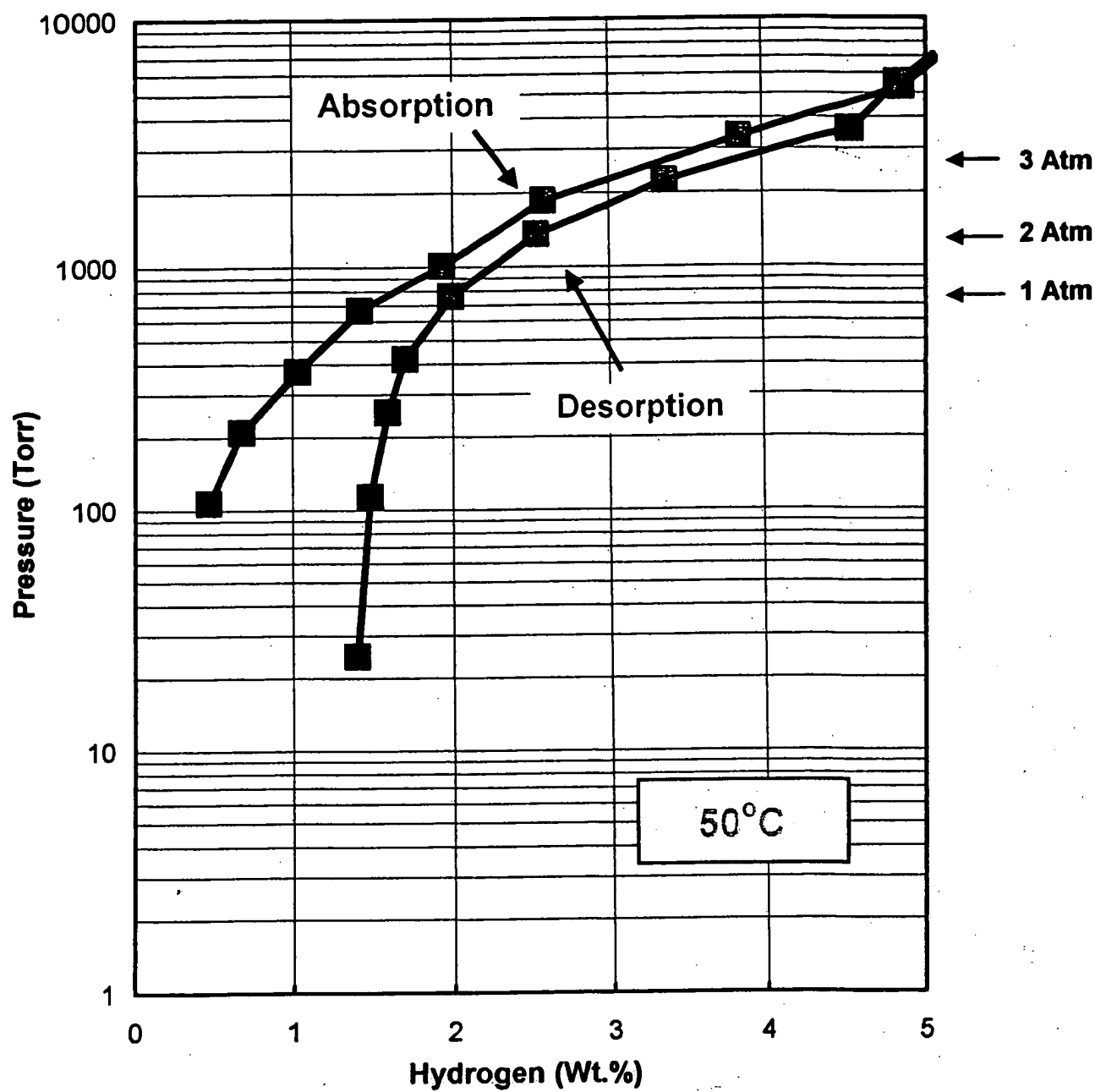


Figure 15

200°C PCT Measurement Result

AR026: $\text{Mg}_{55}\text{Ni}_{36}\text{Co}_3\text{Mn}_6$

AR003: $\text{Mg}_{52}\text{Ni}_{39}\text{Co}_3\text{Mn}_6$

AR037: $\text{Mg}_{47}\text{Ni}_{44}\text{Co}_3\text{Mn}_6$

AR038: $\text{Mg}_{42}\text{Ni}_{49}\text{Co}_3\text{Mn}_6$

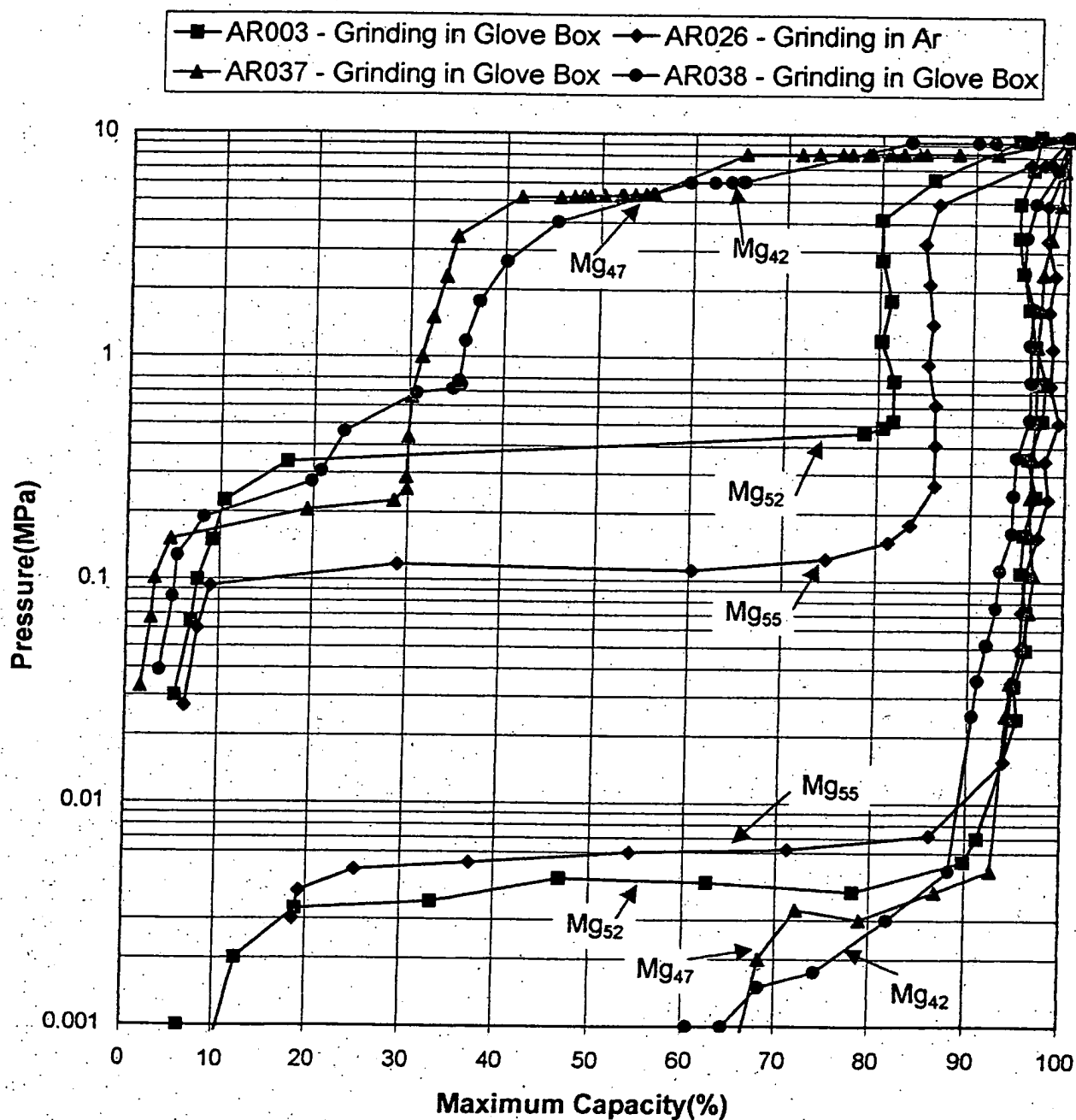
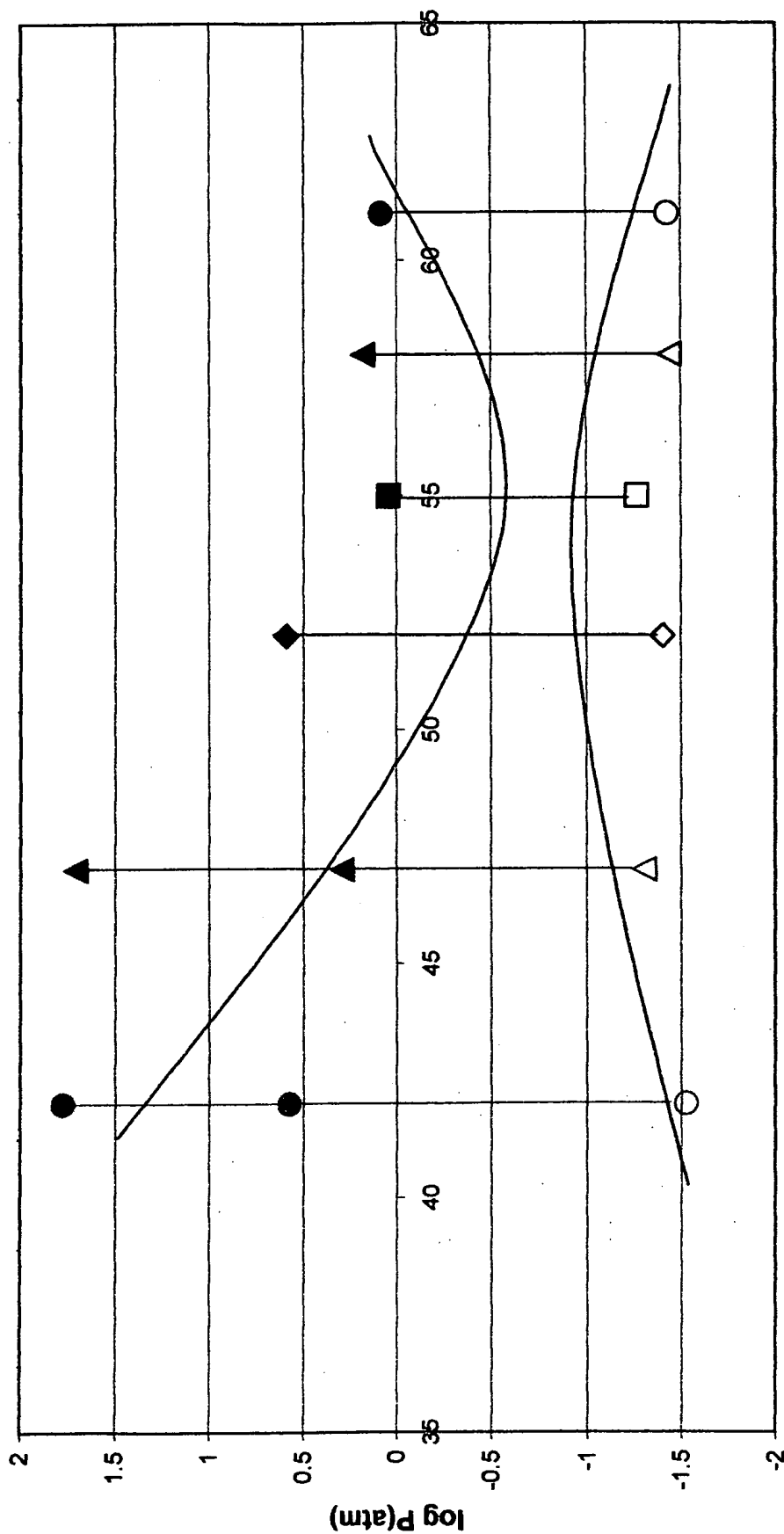


Figure 16

Plateau Pressure Comparison at 200°C Based on Magnesium Content



Magnesium Concentration (atomic%)

Figure 17

Improvement of Low-Temperature MgNiCoMn Alloy Processing

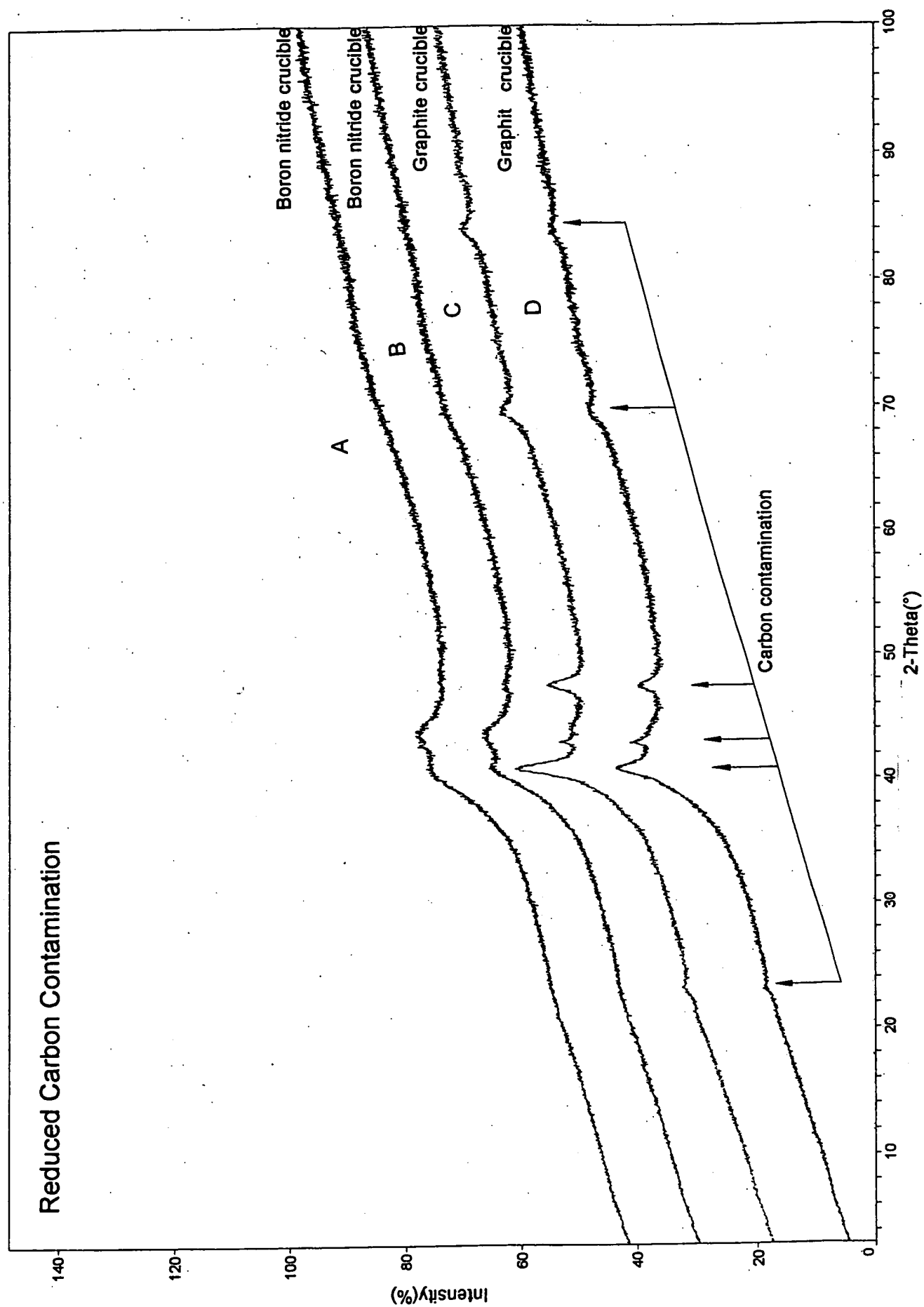


Figure 18

Glove Box Protection (Hydrogen Absorption at 90°C)

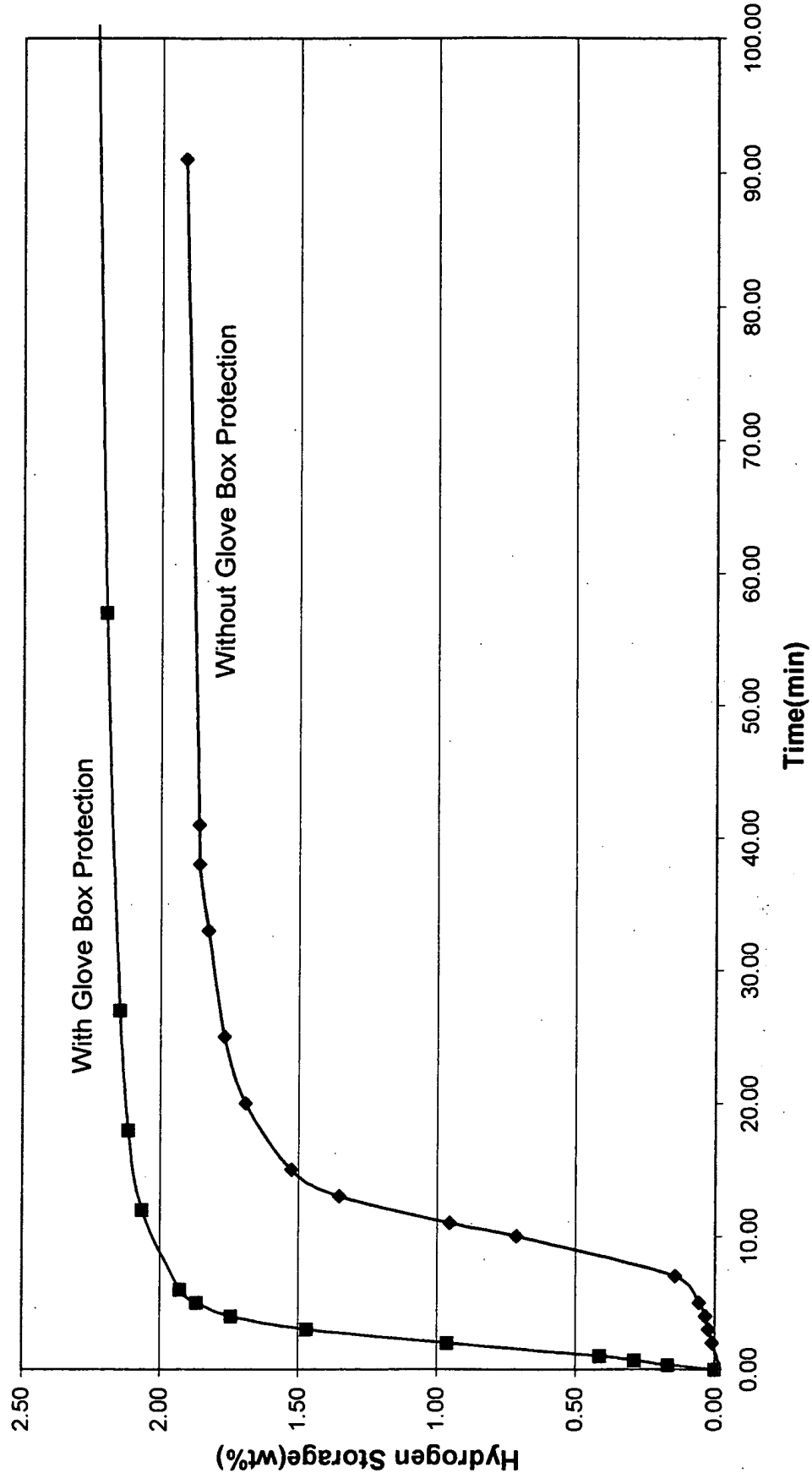


Figure 19

Hydrogen Storage of AR003 at 90°C

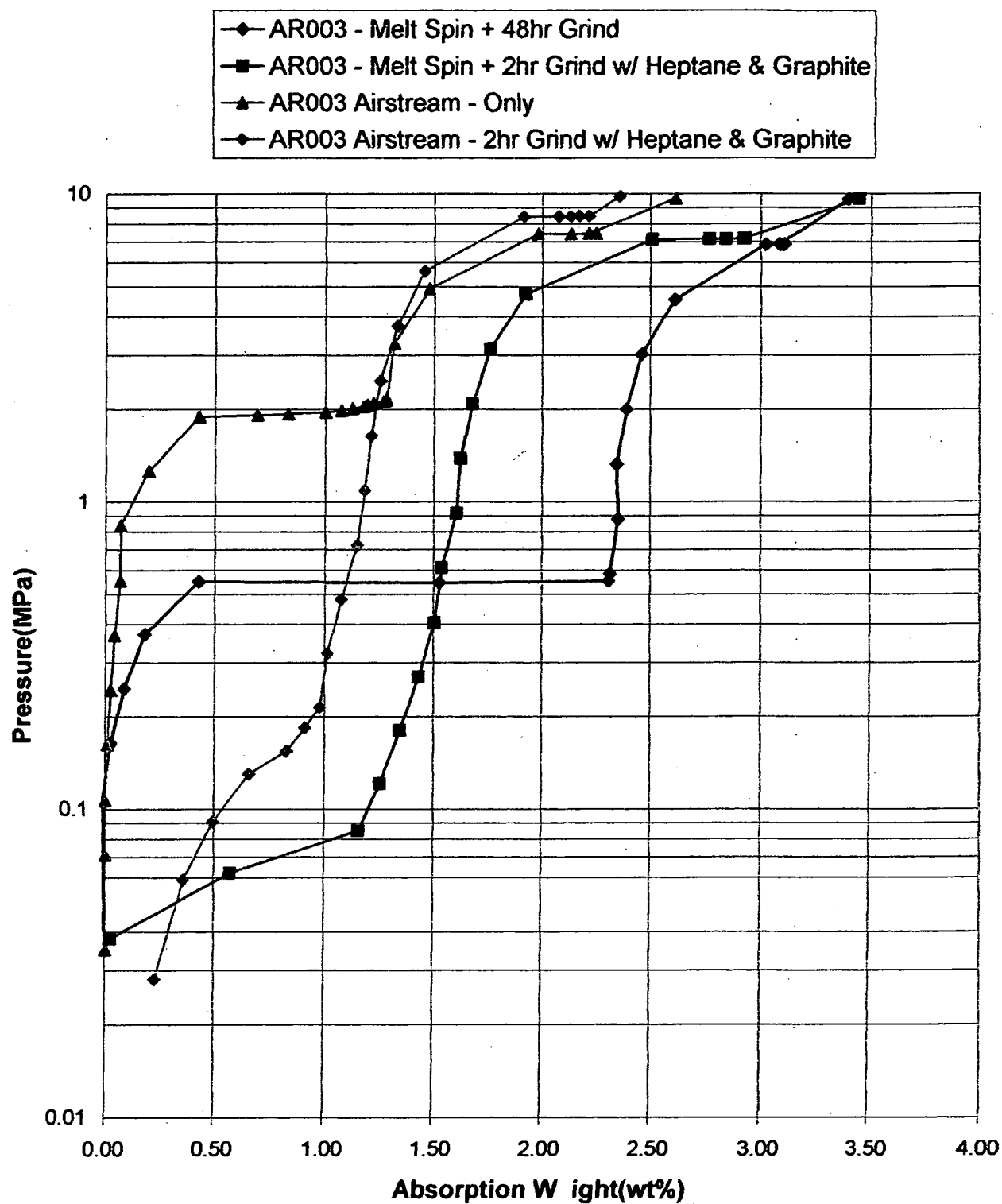


Figure 20

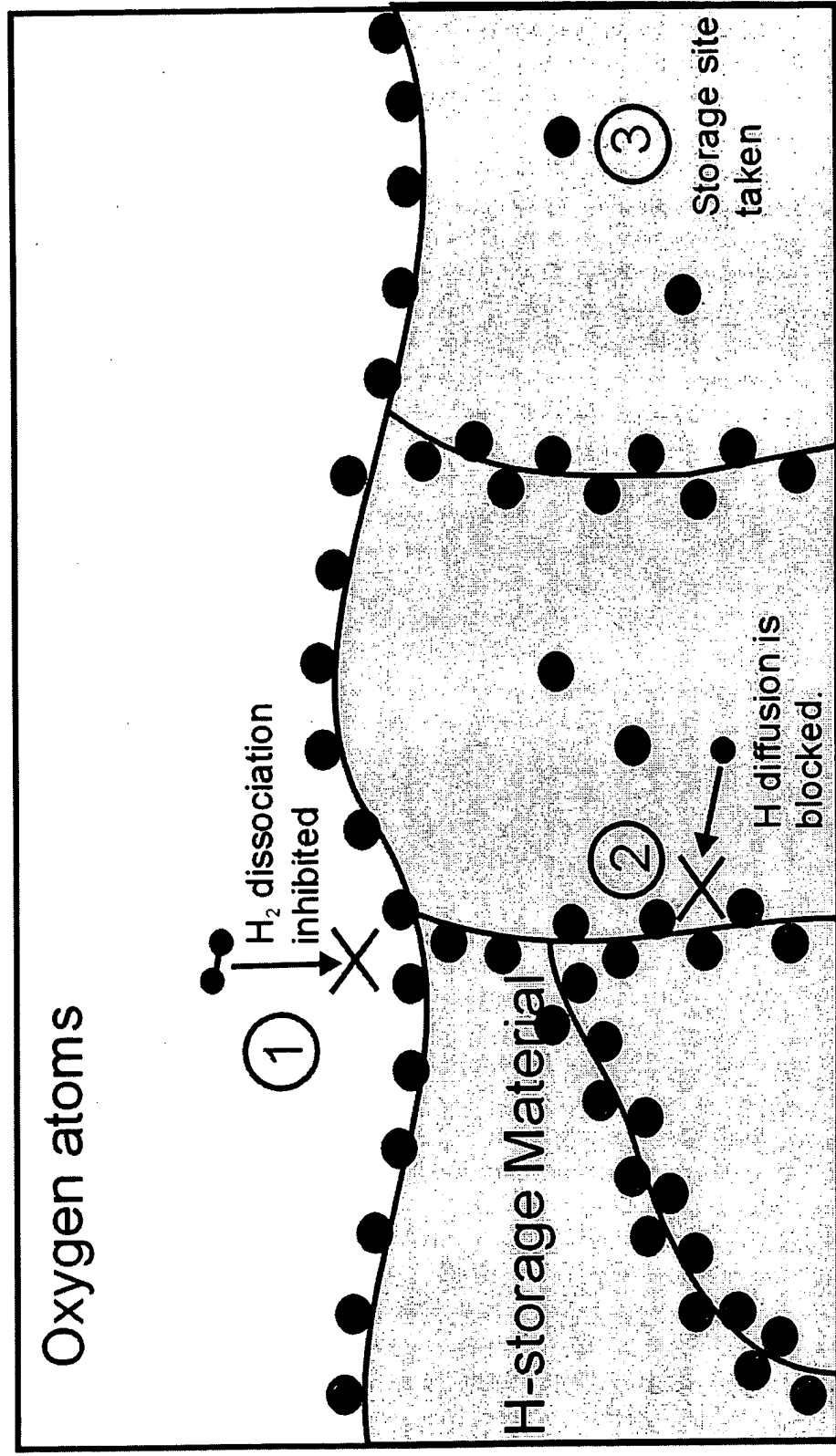


Figure 21

Effect of Ag at 90°C

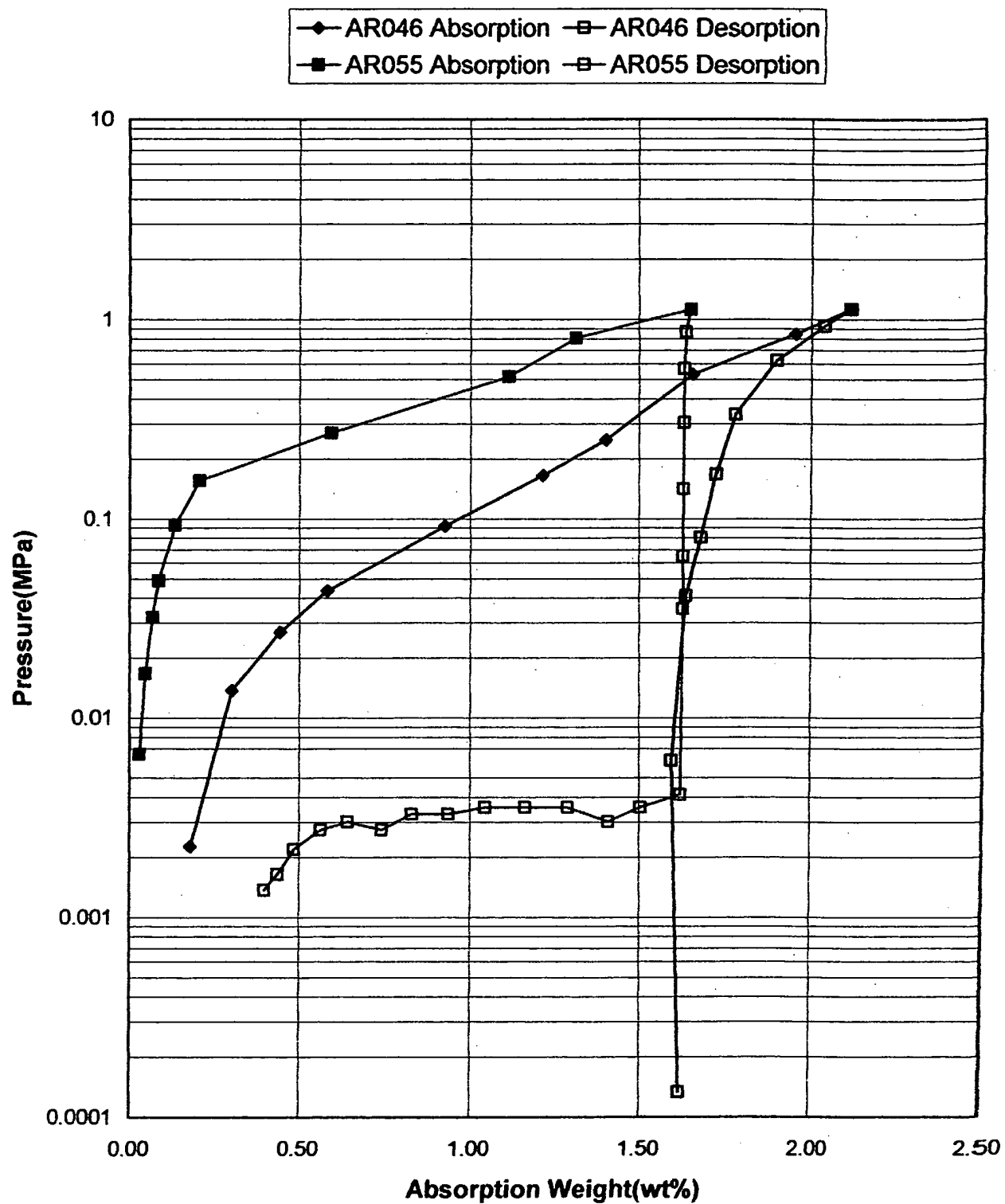


Figure 22

Various Catalysts for Hydrogen Absorption at 90°C

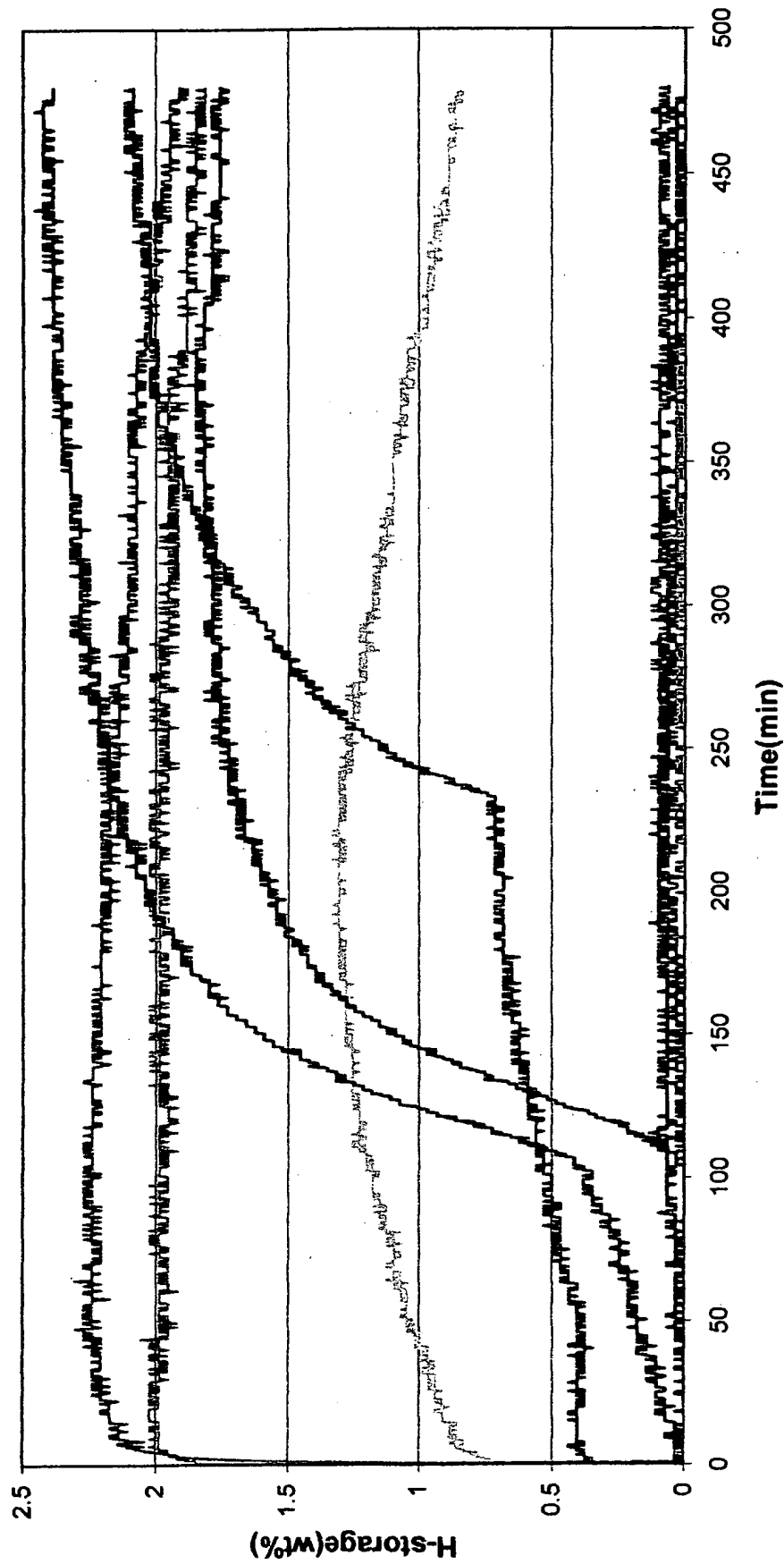
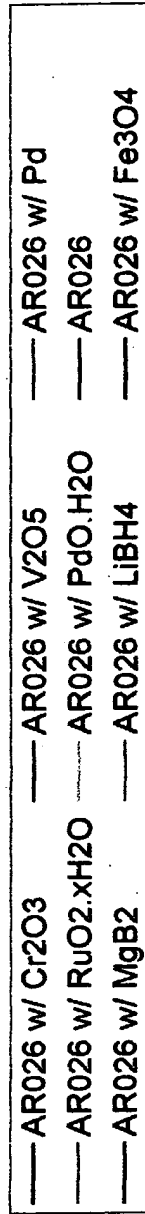


Figure 23